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NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 User Manual

NETGEAR®

NETGEAR, Inc.
350 E. Plumeria Drive
San Jose, CA 95134 USA

202-10426-02
June 2009

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Technical Support

Please refer to the support information card that shipped with your product. By registering your product at *http://www.netgear.com/register*, we can provide you with faster expert technical support and timely notices of product and software upgrades.

NETGEAR, INC. Support Information

Phone: 1-888-NETGEAR, for US & Canada only. For other countries, see your Support information card.

E-mail: support@netgear.com

North American NETGEAR website: *http://www.netgear.com*

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Statement of Conditions

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NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Maximum Wireless Signal Rate Derived from IEEE Standard 802.11 Specifications

Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

Safety and Regulatory Notices

FCC Statement

The WNDA3100v2 has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices

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- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any change or modification to the product not expressly approved by Netgear could void the user's authority to operate the device.

FCC RF Radiation Exposure and SAR Statements

SAR Statement

The NETGEAR WNDA3100v2 has been tested for body-worn Specific Absorption Rate (SAR) compliance. The FCC has established detailed SAR requirements and has established that these requirements have been met while installed in host notebook computer.

RF Exposure Information

The radio module has been evaluated under FCC Bulletin OET 65C (01-01) and found to be compliant to the requirements as set forth in CFR 47 Sections, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. This model meets the applicable government requirements for exposure to radio frequency waves. The highest SAR level measured for this device was 1.380 W/kg.

Canadian Department of Communications Industry Canada (IC) Notice

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210. Cet appareil numérique de la classe B est conforme à la norme NMB-003 et CNR-210 du Canada.

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE: Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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Europe - EU Declaration of Conformity

A printed copy of the EU Declaration of Conformity certificate for this product is provided in the WNDA3100v2 product package.

Èesky [Czech]	NETGEAR, Inc. tímto prohlašuje, že tento NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 je ve shodì se základními požadavky a dalšími pøíslušnými ustanoveními smìrnice 1999/5/ES.
Dansk [Danish]	Undertegnede NETGEAR, Inc. erklærer herved, at følgende udstyr NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt NETGEAR, Inc., dass sich das Gerät NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab NETGEAR, Inc. seadme NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, NETGEAR, Inc., declares that this NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente NETGEAR, Inc. declara que el NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ NETGEAR, Inc. ΔΗΛΩΝΕΙ ΟΤΙ NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente NETGEAR, Inc. déclare que l'appareil NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente NETGEAR, Inc. dichiara che questo NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
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Lietuviø [Lithuanian]	Šiuo NETGEAR, Inc. deklaruoja, kad šis NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart NETGEAR, Inc. dat het toestel NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

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Magyar [Hungarian]	Alulírott, NETGEAR, Inc. nyilatkozom, hogy a NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
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Português [Portuguese]	NETGEAR, Inc. declara que este NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	NETGEAR, Inc. izjavlja, da je ta NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 v skladu z bistvenimi zahtevami in ostalimi relevantnimi doloèili direktive 1999/5/ES.
Slovensky [Slovak]	NETGEAR, Inc. týmto vyhlasuje, že NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 spåòa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	NETGEAR, Inc. vakuuttaa täten että NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar NETGEAR, Inc. att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Product and Publication Details

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About This Manual

The *NETGEAR® RangeMax™ Dual Wireless-N USB Adapter WNDA3100v2 User Manual* describes how to install the NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2 with custom setup, configuration, and troubleshooting. For express installation, please see the *Installation Guide*. The information in this manual is intended for readers with intermediate computer and Internet skills.

Conventions, Formats, and Scope

The conventions, formats, and scope of this manual are described in the following paragraphs:

- **Typographical Conventions**. This manual uses the following typographical conventions:

Italic	Emphasis, books, CDs, file and server names, extensions
Bold	User input, IP addresses, GUI screen text
`Fixed`	Command prompt, CLI text, code
italic	URL links

- **Formats**. This manual uses the following formats to highlight special messages:

	Note: This format is used to highlight information of importance or special interest.

	Tip: This format is used to highlight a procedure that will save time or resources.

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- **Scope**. This manual is written for the RangeMax Dual Band Wireless-N USB Adapter according to these specifications:

Product Version	NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2
Manual Publication Date	June 2009

For more information about network, Internet, firewall, and VPN technologies, see the links to the NETGEAR website in Appendix B, “Related Documents.

Note: Product updates are available on the NETGEAR, Inc. website at *http://www.netgear.com/support*.

How to Use This Manual

The HTML version of this manual includes the following:

- Buttons, > and <, for browsing forwards or backwards through the manual one page at a time
- A button that displays the table of contents and an button. Double-click on a link in the table of contents or index to navigate directly to where the topic is described in the manual.
- A button to access the full NETGEAR, Inc. online knowledge base for the product model.
- Links to PDF versions of the full manual and individual chapters.

How to Print This Manual

To print this manual, you can choose one of the following options, according to your needs.

- **Printing a page from HTML**. Each page in the HTML version of the manual is dedicated to a major topic. Select File > Print from the browser menu to print the page contents.
- **Printing from PDF**. Your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe Web site at *http://www.adobe.com*.

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– **Printing a PDF chapter.** Use the *PDF of This Chapter* link at the top left of any page.

  • Click the *PDF of This Chapter* link at the top left corner of any page in the chapter you want to print. The PDF version of the chapter you were viewing opens in a browser window.

  • Click the print icon in the upper left of your browser window.

– **Printing a PDF version of the complete manual**. Use the *Complete PDF Manual* link at the top left corner of any page.

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  • Click the print icon in the upper left of your browser window.

Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Revision History

Part Number	Version Number	Date	Description
202-10046-02	1.0	May 2009	New Smart Wizard installation
202-10426-01	1.0	July 2006	Original publication

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Chapter 1
Basic Setup

This chapter includes instructions for custom installation of your wireless-N USB adapter and basic configuration. There are two methods that you can use to install the wireless-N USB adapter:

- **Express** Installation uses the NETGEAR Smart Wizard configures your adapter automatically. This method is explained in the *Installation Guide*.
- Installation with **Custom Setup** lets you specify where the software is installed, and select either the NETGEAR Smart Wizard or the Windows utility to configure your wireless-N USB adapter. See "Installation with Custom Setup" on page 1-3.

NETGEAR strongly recommends that you implement wireless security to protect your network from unauthorized access. See Chapter 2, "Network Connections and Wireless Security.

What Is in the Box

The product package should contain the following items:

- NETGEAR RangeMax Dual Band Wireless-N USB Adapter WNDA3100v2
- USB cable and adapter cradle
- *Installation Guide*
- *Resource CD*, including:
  - The Smart Wizard Installation Assistant
  - This manual
  - *Installation Guide*
  - Warranty and Support information

If any of the parts are incorrect, missing, or damaged, contact your NETGEAR dealer. Keep the carton, including the original packing materials, in case you need to return the product for repair.

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What You Need Before You Begin

Verify that your computer meets the minimum system requirements and identify the wireless network settings of the wireless local area network (WLAN) where you will connect before you install and connect your wireless-N USB adapter.

Verify System Requirements

Before installing the wireless-N USB adapter, make sure that these minimum requirements have been met:

- You must have a PC with a Pentium 300 MHz or higher compatible processor with an available USB 2.0 or 1.1 port.

	Note: The maximum speed of a USB v2.0 port is 480 Mbps. If your computer has a USB v1.1 port, the wireless-N USB adapter is limited to that port's maximum speed, which is 14 Mbps.

- A CD drive.
- 10 Mbytes of free hard disk space.
- Vista, Windows XP Home, or Windows XP Professional. Some versions of Windows ask for the original Windows operating system installation files to complete the installation of the WNDA3100v2 driver software.

	Note: Windows XP users must install SP2 or install the KB822603 hot fix (update), which fixes the USB 2.0 host controller driver. Go to the following link to install the hot fix: *http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=733dd867-56a0-4956-b7fe-e85b688b7f86*

Observe Wireless Location and Range Guidelines

For best performance, place the wireless-N USB adapter at least 4 feet (over 1 meter) away from the wireless router or access point.

Computers can connect over wireless networks indoors at a range that varies significantly based on the physical location of the computer with the wireless-N USB adapter. For best results, avoid

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potential sources of interference, such as the following:

- Large metal surfaces
- Microwave ovens
- 2.4 GHz cordless phones

Note: If there is 2.4 GHz interference at your location, such as from a cordless phone, you can change the setting to 5 GHz for better wireless throughput if your wireless router or access point supports it. See “Advanced Settings” on page 2-23.

In general, wireless devices can communicate through walls. However, if the walls are constructed with concrete, or have metal, or metal mesh, the effective range decreases if such materials are between the devices.

Installation with Custom Setup

Note: For Express installation, see the *Installation Guide*.

With Custom setup you can specify where the files are installed. You can also choose whether or not you want to install the Smart Wizard utility or use only the Windows utility to configure and manage your wireless-N USB adapter.

- **Custom** installation using the Smart Wizard utility. The Smart Wizard provides a complete and easy-to-use set of tools to:
  - View details about wireless networks in your area.
  - Manage your network connections and connect securely using Push 'N' Connect (WPS).
  - Configure wireless settings for your wireless-N USB adapter.
  - Save your wireless network settings in profiles.
- **Custom** installation using the Windows utility. You can choose not to install the Smart Wizard and to use only the Windows Utility to install and manage your wireless network. If you choose to do this, you will not be able to use the Smart Wizard to configure your wireless-N USB adapter or to connect to a wireless network.

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Installing the WNDA3100v2 Software

To install the wireless-N USB adapter with custom setup:

1. Insert the *Resource CD*. If the CD main page does not display, browse the files on the CD and double-click *Autorun.exe*.
2. Select **Install the Software**. The Software Update Check screen displays.
3. If you are connected to the Internet, click **Check for Updates**. If not, click **Install from CD**.
4. The NETGEAR Smart Wizard Welcome screen displays. Click next, select **I Agree** to accept the license agreement, and then click **Next**.
5. For the Setup Type, select **Custom**, and then click **Next**:

Figure 1-1

6. Browse to select the destination folder for your wireless adapter software, and then click **Next**.
7. Select one of the following methods to configure and manage your wireless network:

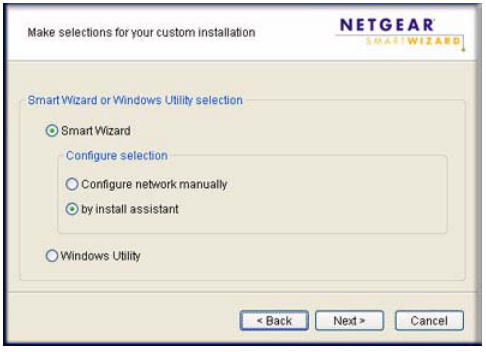

Figure 1-2

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- **Smart Wizard**. Allows you to manage your wireless networks with the NETGEAR WNDA3100v2 software and to connect securely using Push 'N' Connect.
  - **Configure network manually**. Specify the settings for your wireless-N USB adapter in the Settings screen.
  - **by install assistant**. Allow the Smart Wizard Install Assistant to automatically configure the settings for your wireless-N USB adapter.
- **Windows Utility**. Connect to and manage your wireless networks using only the Windows configuration utility. For more information about Windows utilities, see the Windows documentation or the NETGEAR application note at: *http://documentation.netgear.com/reference/enu/winzerocfg/index.htm*.

8. Click **Next**.
   - For Windows XP, if a Windows logo testing message appears, click **Continue Anyway**.
   - If a message that Windows Vista cannot verify the publisher of this driver displays, click **Install this driver software anyway**.

Inserting the Wireless-N USB Adapter

The WNDA3100v2 software is installed. You will be prompted to connect your adapter.

1. Locate an available USB port on your PC.
2. Insert the wireless adapter into the USB port. You can attach the wireless USB adapter directly or use the USB cable (see "Using the USB Adapter Cradle" on page 1-8).
3. Depending on which Windows operating system you are using, do one of the following:
   - **Windows Vista**. The adapter and driver are automatically added. If a message that Windows Vista cannot verify the publisher of this driver displays, click **Install this driver software anyway**.
   - **Windows XP**. Follow the on-screen instructions for the Found New Hardware Wizard.
     - If a Windows logo testing message appears, click **Continue Anyway**.
     - When the Found New Hardware Wizard is complete, click **Finish**.
4. On the NETGEAR Smart Wizard screen, click **Next** to proceed.
5. If you selected Smart Wizard, then click **Next** and continue with the following section "Connecting to a Wireless Network."

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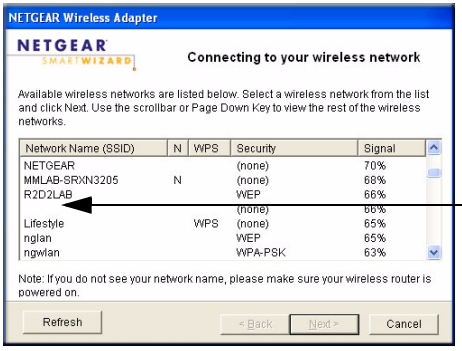
Connecting to a Wireless Network

If you installed the Smart Wizard, you can use the WNDA3100v2 software to connect to a wireless network.

Smart Wizard, by Install Assistant

If you selected the **by Install Assistant** radio button during installation, you are prompted to connect wirelessly with one of the following screens:

WPS-capable networks in your area



No WPS-capable networks in your area

Figure 1-3

	Note: If you are not sure if your router supports WPS, select **No** to connect. If your router does not support WPS and you select **Yes**, the router or access point connection will time out and no wireless network connection will be established.

1. Follow the on-screen prompts to connect to a wireless network:
   - If your router supports WPS and you want to use WPS to create a secure connection, leave the radio button selected, and click **Next** to continue. Follow the Smart Wizard steps to connect using WPS.
   - If your router does not support WPS, select your wireless network name from the list of wireless networks and click **Next** to continue. (If your wireless network has implemented security, you need to know which type of security (WEP, WPA-PSK, or WPA2-PSK) and you need the passphrase to complete your setup.

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2. Create a wireless settings Profile. The Smart Wizard asks if you want to save a profile:

Figure 1-4

Creating a profile makes it easy to quickly connect to wireless networks in different locations.

a. If your wireless network has implemented security, and you did not use Push 'N' Connect, select the radio button for the security type and enter the security passphrase in the **Passphrase** field.

b. Enter a unique name for your settings in the **<Enter a Profile name here>** field. If you do not enter a profile name, your settings will be saved using the name **Profile.**

c. Click **Next.**

d. Review your settings and then click **Finish**.

Figure 1-5

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e. Your settings are saved to the profile you selected

3. The WNDA3100v2 icon appears in the system tray and on the desktop. The Smart Wizard Settings tab also displays (see "Smart Wizard Status Bar" on page 1-11) and the adapter initiates your wireless connection. It can take up to a minute to complete your connection.

Smart Wizard, Configure Network Manually

If you selected the **Configure Network Manually** radio button during installation, the Settings screen displays:

If you saved a profile but did not type a name it is automatically saved as Profile.

Figure 1-6

- If you are in a location with an unsecured wireless network, the Setup Wizard automatically connects to it.
- If the wireless networks in your area use wireless security (strongly recommended) then you must know the Network Name (SSID) and the security settings in order to join a network. See "Wireless Network Name (SSID) and Security Settings" on page 2-14.
- You can click the **Join a Network** button to select a wireless network in your area connect to it. See "Joining a Network" on page 2-2.

Using the USB Adapter Cradle

You can use the USB cable to extend the range of your adapter and obtain better wireless reception. Follow the instructions to attach the USB cable, plastic cradle, and loop-and hook fasteners to a computer monitor.

1. Attach the prickly side of one fastener to the middle back of the plastic cradle.

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2. Attach the smooth side of the fastener to the back of your monitor, near the top for better reception.

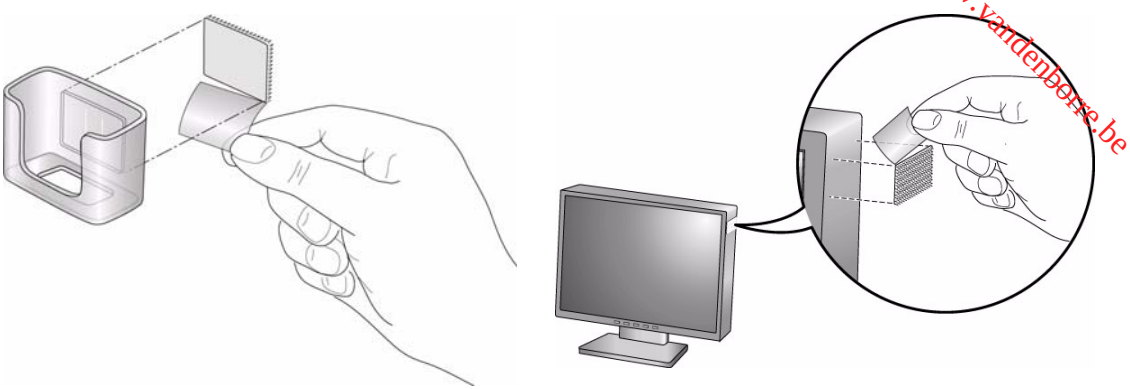

Figure 1-7

3. Insert the adapter in the plastic cradle and attach the USB cable to the adapter and the computer.
4. Attach the cradle with the adapter to the side of the PC monitor where you placed the fastener.

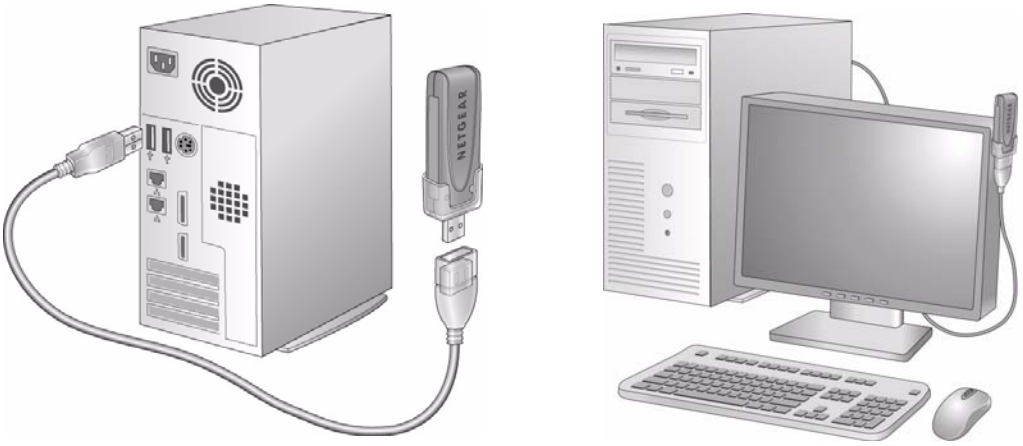

Figure 1-8

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Monitoring Your Wireless Network and the Internet Connections

The wireless-N USB adapter has indicators in three locations that show the status of your connection to a wireless network and to the Internet:

- **WNDA3100v2 icon.** After you install the WNDA3100v2 software, the icon appears on the desktop and in the right on the Windows task bar. It is color coded to show the status of the connection. See the following section, "WNDA3100v2 Icon".
- **Smart Wizard status bar**. Clicking on the system tray icon opens the Smart Wizard. The status bar at the bottom of the screen shows details about your wireless and Internet connection. See "Smart Wizard Status Bar" on page 1-11, and "Viewing Wireless Networks in Your Area" on page 2-1.
- **Adapter LED**. The LED on the wireless-N USB adapter indicates the condition of your wireless link. See "Wireless-N USB Adapter LED" on page 1-12.

WNDA3100v2 Icon

The WNDA3100v2 icon is on the desktop and in the Windows system tray, on one end of the task bar in the Microsoft Windows desktop. The WNDA3100v2 icon will change colors depending on the condition of the adapter. The following table describes the colors and conditions indicated.

Color	Condition	Description
Red	The wireless-N USB adapter has no connection to any other wireless node.	The wireless-N USB adapter cannot link to any other wireless node, or the link is lost. Check your configuration, or try moving to a location where the wireless signal quality is better.
Yellow	The wireless-N USB adapter has a connection with another wireless node.	The wireless link is weak. Move to a better location, such as closer to the wireless access point. Also, look for possible interference such as a 2.4 GHz cordless phone or large metal surface.
Green	The wireless-N USB adapter has a connection with another wireless node.	The wireless-N USB adapter has established good communication with an access point, and the signal quality is strong.

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If you right-click the WNDA3100v2 icon in the system tray, you can disable its Internet notification feature by clearing the check mark enabling notification, as shown in the following figure. If you do so, then only the IP address is shown.

Figure 1-9

In Vista, there is one more option: Enable NETGEAR Smart Wizard.

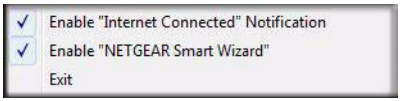

Figure 1-10

If you clear the check mark for Enable NETGEAR Smart Wizard, the NETGEAR Smart Wizard is disabled, and you must set up the wireless adapter with Vista auto-configuration.

Smart Wizard Status Bar

Click the icon to open the Smart Wizard Settings tab. The status bar is located at the bottom of the Settings tab.

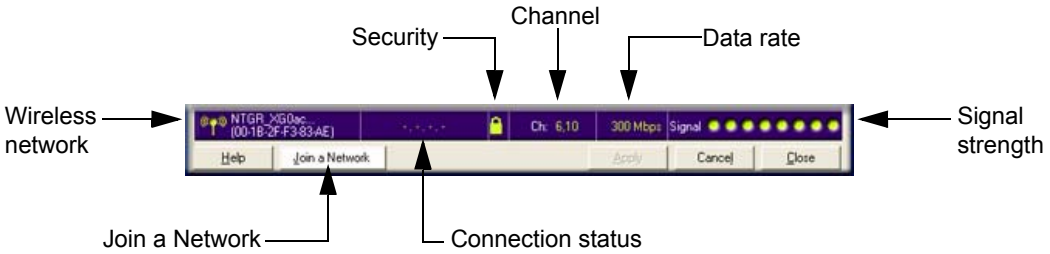

Figure 1-11

The following table describes how to interpret the Smart Wizard status bar.

Understanding the Status Bar	
Wireless network	Identifies which wireless network you have joined.
Security	• A closed lock indicates that security is enabled. • An open lock indicates an open network without wireless security.

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Understanding the Status Bar (continued)	
Channel	The wireless channel used by the network. If many wireless networks in your area use the same channel, they can interfere with one another.
Data rate	To optimize the wireless data rate (throughput), connect to a network with a high-speed router or access point and a high-speed Internet connection. See Chapter 3 "Wireless Network Performance".
Signal strength	More dots indicates a stronger signal. Usually, you experience higher throughput when the signal is strongest.
Join a Network	Click **Join a Network** to start the Connection Wizard.
Connection status	The status of your network connection. • **Connected to Internet**. The wireless Internet connection is OK. • **Connected to Router**. The wireless connection to the router is OK, but the router is not connected to the Internet. **169.254.x.x or ___.___.___.___.** The wireless connection to the router is OK, but there is a problem with the router. See the online help or Chapter 4, "Troubleshooting".

Wireless-N USB Adapter LED

The LED on the wireless-N USB adapter indicates the condition of the wireless link, as described in the following table.

Wireless-N USB Adapter	LED	Meaning
 The LED color changes depending on the type of network connection. Amber indicates 2.4 GHz, and blue indicates 5 GHz.	Off	• The wireless-N USB adapter is not plugged in to the USB port. • The wireless-N USB adapter is in power save mode (default from power up or reset).
	Slow blinking	• **Alternating amber and blue**. The wireless USB adapter is scanning for a network. • **Amber.** The wireless USB adapter is connecting to a network at 2.4 GHz. • **Blue.** The wireless USB adapter is connecting to a network at 5 GHz.
	Blinking	The wireless USB adapter is connected to a wireless network, and is sending or receiving data.
	Solid	The wireless-N USB adapter is connected to a wireless network, but it is not sending or receiving data.

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Removing the WNDA3100v2 Software

You can remove the wireless adapter software in these two ways:

- Select the Windows Start menu > All Programs > NETGEAR WNDA3100v2 Adapter program group > Uninstall NETGEAR WNDA3100v2 Software, and then follow the screen prompts.
- Select Windows Start menu >Control Panel > Add or Remove Program, and then select the NETGEAR WNDA3100v2 Adapter option, and follow the screen prompts.

Upgrading the WNDA3100v2 Software

Upgrades might be available at the NETGEAR website. To install an upgrade, follow these steps.

1. Write down the settings for any profiles that you want to save. They will not be retained.
2. Download the upgrade from the NETGEAR website Support page.
3. Remove the WNDA3100v2 software from your computer.
4. Remove the WNDA3100v2 adapter from your computer, and if prompted restart your computer.
5. Run the installer that you downloaded (the file ends in .exe).
6. Follow the installer instructions, and if prompted, restart your computer.

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Chapter 2
Network Connections and Wireless Security

This chapter explains how to use your wireless-N USB adapter to connect to your wireless local area network (WLAN) and how to set up wireless security for the wireless-N USB adapter so that it matches the wireless security settings for your network.

During installation, if you selected the **Custom** Setup Type, and the **Windows Utility** radio button, the features described in this chapter will not be available. If this is the case, and you want to use the Smart Wizard, remove the WNDA3100v2 software (see "Removing the WNDA3100v2 Software" on page 1-13). Then use the *Resource CD* to reinstall the software. Either select the **Express** Setup Type, or use the **Custom** Setup Type, and leave the **Smart Wizard** radio button selected.

Viewing Wireless Networks in Your Area

You can use the Networks tab to view all available wireless networks in your area. You can also scan to search for wireless networks and refresh the tab.

To view information about wireless networks, click the icon to open the Smart Wizard. Then click the Networks tab to display the following screen:

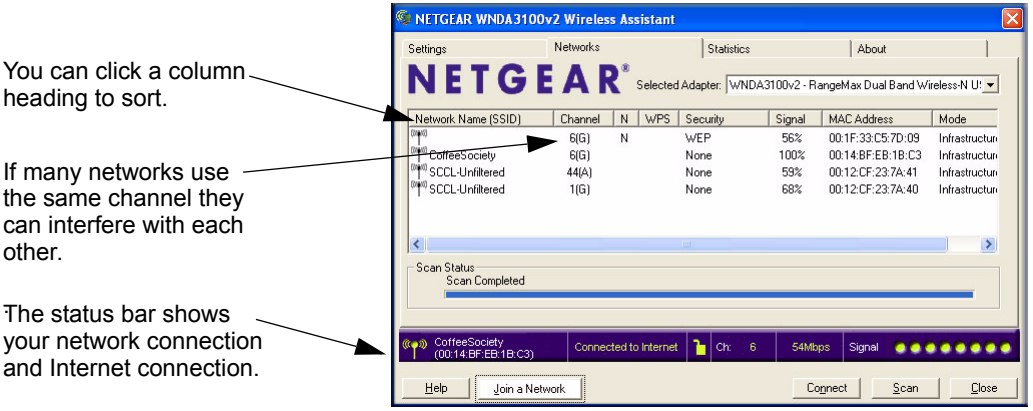

Figure 2-1

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Network Tab Field or Button	Description
Network Name (SSID)	The name assigned to a wireless network. This is the same as the SSID or ESSID configuration parameter. Note that as a security measure, some wireless access points do not broadcast their SSID. In such cases, the SSID field is blank even though the rest of the information is still displayed.
Channel	The channel determines which operating frequency is used.
N	The access point supports wireless N mode.
WPS	The access point supports WPS.
Security	Identifies whether the wireless network uses security settings such as WPA2-PSK, WPA-PSK, or WEP.
Signal	The signal strength of the communications.
MAC Address	The hardware address (MAC address) of the wireless device broadcasting this information.
Mode	The type of wireless network — Access. Point (Infrastructure) or Computer-to-Computer (Ad Hoc)
Help button	Display online help.
Join a Network button	View networks and join a network. See the following section "Joining a Network".
Connect button	Connect to the network that you selected
Scan button	Check for wireless networks. Clicking Scan refreshes the screen.
Close button	Close the window.

Joining a Network

During the WNDA3100v2 software installation, the Smart Wizard lists the available networks. After installation you can use the Join a Network button on the Network tab at any time to view the available networks and select the one that you want to use.

Note: Make sure that you know the wireless security settings for the network that you want to use. For example, if a network uses WEP, you must know the WEP key in order to connect to it. If you use secure networks frequently, set up profiles for each network with the wireless network and security settings.

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To join a network:

1. Use the icon to open the Smart Wizard. On the status bar, click **Join a Network**.
2. If the Smart Wizard detects an access point or router with WPS, it displays the WPS screen (Figure 2-3 on page 2-5). WPS is described in "Using Push 'N' Connect (WPS) to Connect to a Wireless Network". To connect without using WPS, select **No**, and click **Next**.
3. Select a network from the drop-down list. If you select a hidden network, then you must enter the SSID. Click **Next**.

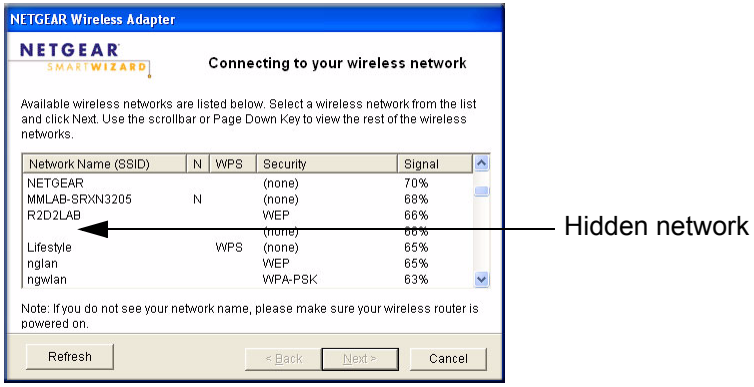

Figure 2-2

4. Follow the steps of the wizard to specify the wireless security if used, and to create a profile.
5. Review your settings, and click **Finish**.
6. You can use the status bar to verify your network connection. For more information, see "Smart Wizard Status Bar" on page 1-11. Click **Close** to exit the Smart Wizard.

Using Push 'N' Connect (WPS) to Connect to a Wireless Network

This feature is based on the Wi-Fi Protected Setup (WPS) standard (for more information, see *http://www.wi-fi.org*). WPS automatically configures the network name (SSID) and wireless security for the access point or router and the wireless-N USB adapter. Note that WPS is not a new security feature—it makes existing security features easier to configure.

To use WPS with your wireless-N USB adapter you need:

- An access point or router that supports WPS. It will have a WPS symbol.

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- The computer with the wireless-N USB adapter must be running Windows XP, or Vista (32/64 bits).

	Notes: If you connect using WPS and later lose the settings, they can be restored by reconnecting using the WPS procedures described in this section.

To connect the wireless-N USB adapter to an access point or router that supports WPS, there are several methods:

- **Starting with the adapter**, do one of the following:
  - Connect during initial installation. See the *Installation Guide*, provided in the package and on the *Resource CD*.
  - Click **Join a Network** on the Smart Wizard Settings screen (see "Smart Wizard Status Bar" on page 1-11).
  - Click an access point or router that supports WPS in the Networks tab (see "Viewing Wireless Networks in Your Area" on page 2-1).
- **Starting with the router or access point**. Log in to the router or access point, then follow the router or access point's prompts to connect a WPS client.

You can use either a push button or PIN entry to connect using WPS:

- **Push Button Configuration**. Press a push button or push dome on the access point or router, or click an on-screen button in the software. This is a fairly new technology, so not all access points and routers provide a push button. See "Using a WPS Button to Connect to a Wireless Network" on page 2-5.
- **PIN entry**. Use the router or access point's Personal Identification number (PIN), or use the wireless-N USB adapter's PIN. See "Using a PIN to Connect to a Wireless Network" on page 2-6.

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Using a WPS Button to Connect to a Wireless Network

To join a network using a push button:

1. Click the icon to open the Smart Wizard. On the status bar, click **Join a Network**. The adapter detects a network with WPS:

Figure 2-3

	Note: If you are not sure if your router supports WPS, select **No** to connect. If your router does not support WPS and you select **Yes**, the router or access point connection will time out and no wireless network connection will be established.

2. If your router supports WPS, select **Yes**, and then click **Next**.
3. Select **Yes** (to use a push button), and then click **Next**.
4. Log in to the access point or router that you have selected.
5. From the router's main menu, select **Add WPS Client**. On the Add WPS Client screen, select **Push Button**.
6. To start the WPS process, either press the push button on the access point or router, or click the icon on the router's Add WPS Client screen.

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7. Within 2 minutes, return to the wireless-N USB adapter. Either press the WPS button on your wireless-N USB adapter, or click the WPS button on the WNDA3100v2 Smart Wizard screen.

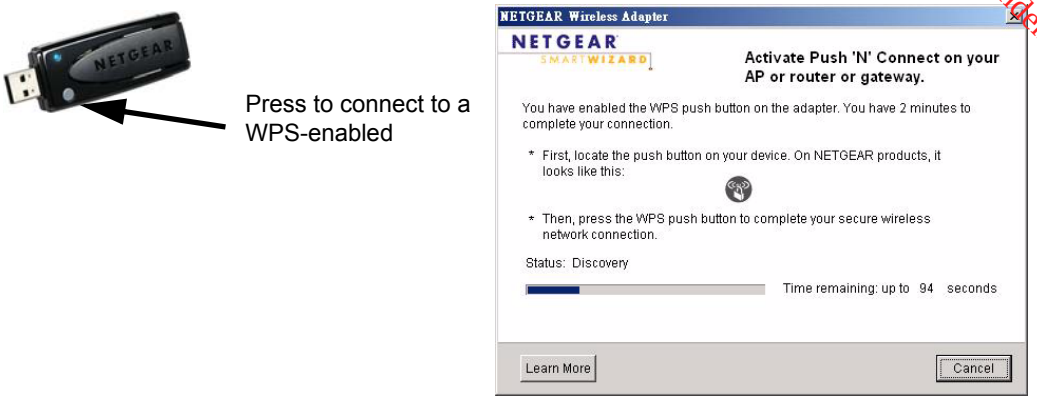

Figure 2-4

The wireless-N USB adapter security is set to WPA-PSK [TKIP]. Some WPS routers support WPA2-PSK [AES], with the same SSID and passphrase. You can change the adapter to WPA2-PSK [AES] using the Security setting in the Settings screen.

8. You can use the Status Bar to verify your network connection. For more information, see "Smart Wizard Status Bar" on page 1-11. Click **Close** to exit the Smart Wizard.

Using a PIN to Connect to a Wireless Network

You can either use the router or access point's PIN; or the wireless-N USB adapter can generate a PIN to connect to the router or access point.

To use a PIN to connect to an access point or router:

1. Click the icon to open the Smart Wizard of the wireless-N USB adapter.

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2. On the status bar, click **Join a Network** (or click the **Networks tab** and select the network). The wireless-N USB adapter detects a network with WPS.

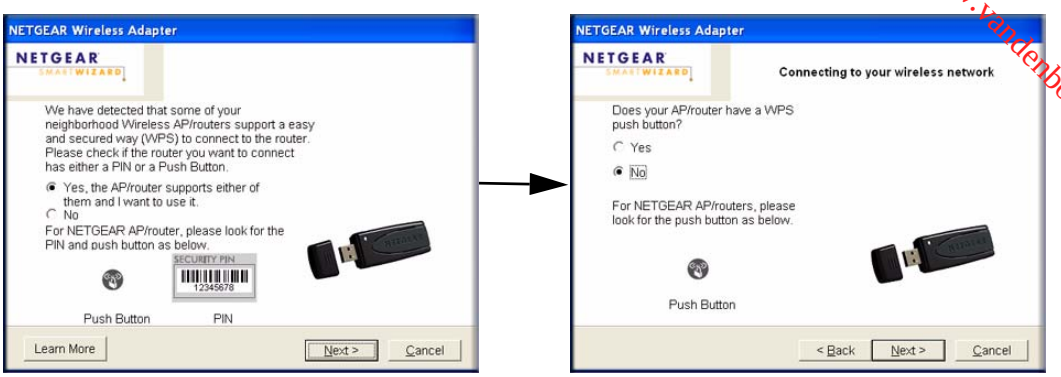

Figure 2-5

3. To use a PIN, select **No** to avoid using a push button. Click **Next**, and then do either of the following:

   - To use the wireless router or access point's PIN, enter it in the field provided. The adapter will connect with the router.

Figure 2-6

   - To generate a PIN for the wireless-N USB adapter, select the radio button for the adapter to generate a random PIN. The adapter generates and displays a random PIN.

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– Write down the generated PIN.

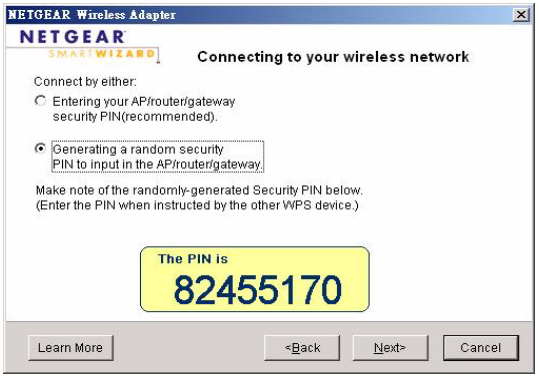

Figure 2-7

– On the access point or router that you have selected, log in to the router or access point, then follow the prompts to enter the adapter's PIN.

The router will connect to the adapter.

Note: The adapter security is set to WPA-PSK [TKIP]. Some WPS routers support WPA2-PSK [AES], with the same SSID and passphrase. You can change the adapter to WPA2-PSK [AES] using the Security setting in the Settings screen.

4. You can use the Status Bar to verify your network connection. For more information, see "Smart Wizard Status Bar" on page 1-11.

Creating a Profile

The WNDA3100v2 Smart Wizard uses profiles to store all the settings for a particular wireless network. There are three special profile names: Default, Profile, and New Profile.

- **Default**.Your wireless-N USB adapter connects to any network. It automatically tries to connect to the first wireless network without security that it finds.
- **Profile**. If you save a profile but do not type a name in the **Profiles** field, the name Profile is used to save your settings. If you do this more than once, you are asked if you want to replace the previous settings stored in Profile.

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- **New Profile**. If you chose not to save a profile and have connected to a new wireless network, the **Profiles** field on the Settings screen shows **New Profile**.
- **SSID - WPS**. When you use WPS to connect to a wireless network, this profile name is created automatically.

You can store multiple profiles and recall the one that matches the network you want to join. If you use your computer to connect to different wireless networks, you can create a profile for each wireless network. Then, you can easily load the profile that has all the settings that you need to join the network you are using at the time. There are two types of wireless network profiles that you can set up:

- **Access Point (Infrastructure)**. Connect to an access point or router with the 802.11 infrastructure mode.
- **Computer-to-Computer (Ad Hoc)**. Connect directly to another computer with the 802.11 Ad Hoc mode.

For more information about wireless network modes, see the link to the online document in wireless reference document at: “Wireless Communications:” in Appendix B.

Access Point Profiles

You can set up a profile by connecting to a network and then saving the settings (see “Joining a Network” on page 2-2, or you can enter the network settings on the Settings screen.

To set up a profile from the Settings screen:

1. Click the icon to open the Smart Wizard. The Settings tab displays:

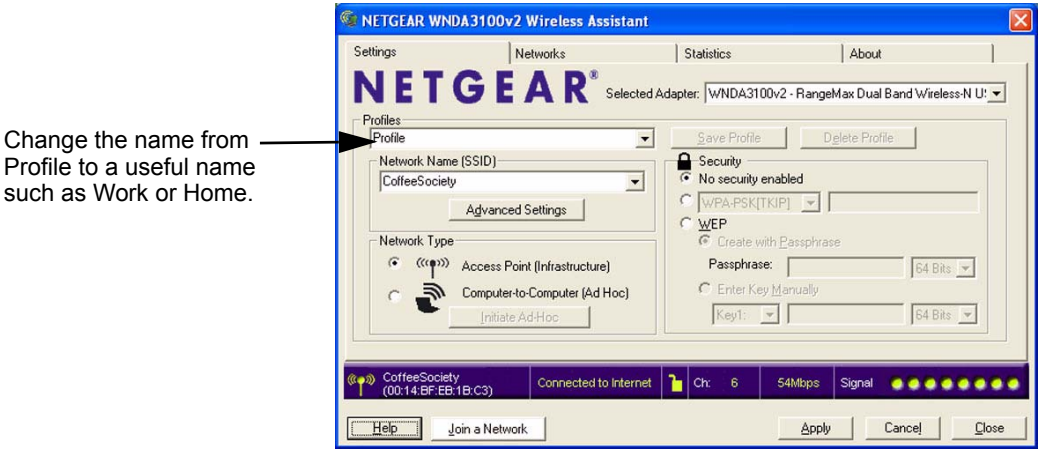

Figure 2-8

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2. Enter the network settings.

   a. In the Network Type section, make sure that **Access Point (Infrastructure)** is selected.

   b. In the **Profiles** field, type a name for the profile.

   c. In the **Network Name (SSID)** field, select a network or enter the SSID.

	Note: You will not get a wireless network connection unless the network SSID matches exactly the SSID used by the access point.

3. Specify the wireless security for the network.
4. Click **Save Profile**.

   All the configuration settings are saved in this profile.

5. To use the profile, click **Apply**.
6. Verify wireless connectivity to your network.

   Use a browser to connect to the Internet, or check for file and printer access on your network. You can check the status bar in the Smart Wizard for the current connection status.

	Note: If you cannot connect, see Chapter 4, “Troubleshooting”. For problems with accessing network resources, the Windows client and file and print sharing software might not be installed and configured correctly on your computers.See the link to “Internet Networking and TCP/IP Addressing:” in Appendix B.

Setting up a Computer-to-Computer (Ad Hoc) Profile

The Computer-to-Computer setting uses Ad Hoc mode. Ad Hoc mode is an 802.11 networking framework in which devices or computers communicate directly with each other, without the use of a router or access point. For example, this mode is used when two Windows PCs are configured with file and print sharing enabled and you want to exchange files directly between them.

	Note: Ad Hoc mode does not work using DHCP settings. Ad Hoc mode requires either static IP addresses (such as 192.168.0.1) or the IPX protocol. For help setting up static IP addresses, see the PC Networking Tutorial on the *Resource CD*.

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To create an Ad Hoc mode profile:

1. Click the icon to open the Smart Wizard. The Settings tab displays:

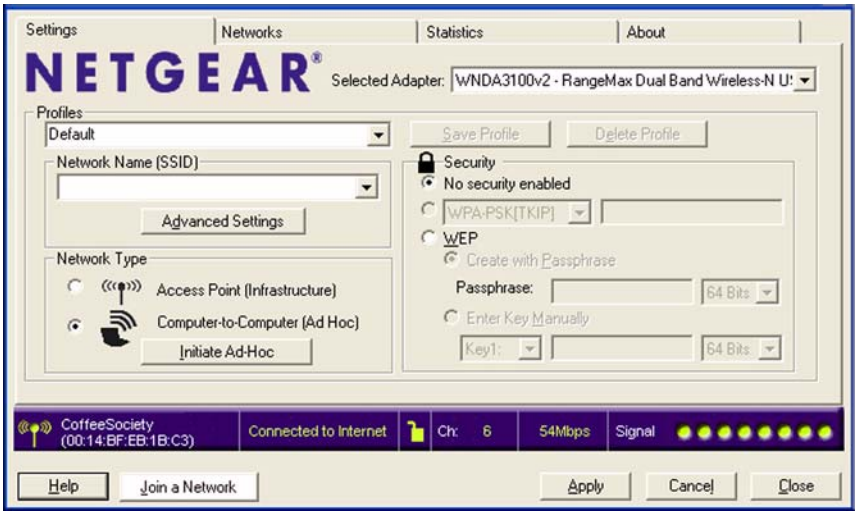

Figure 2-9

2. Enter the network settings.
   a. Select **Computer-to-Computer (Ad Hoc)** for the network type.
   b. Select or enter the network name (SSID) for the Ad Hoc network.
   c. In the **Profiles** field, type the name of the profile.
   d. Click **Apply**.
3. Save your settings in a profile.
   a. Click **Save Profile**, and all the configuration settings are saved in this profile.
   b. Click **Apply**, then click **Close** to exit the Smart Wizard, or click **Cancel** to return to the previous settings.
4. Configure the computer network settings.
   a. Configure each computer with either a static IP address or with the IPX protocol.
   b. Restart the computers.
5. Verify wireless connectivity between your peer devices with the ping program:

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a. On the Windows taskbar, select Start > Run.

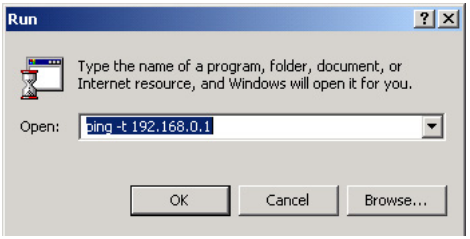

Figure 2-10

b. Assuming the target PC is configured with 192.168.0.1 as its IP address, type:

ping -t 192.168.0.1

and then click **OK**.

c. A continuous ping will be sent to the device with the 192.168.0.1 static IP address. The ping response should change to Reply.

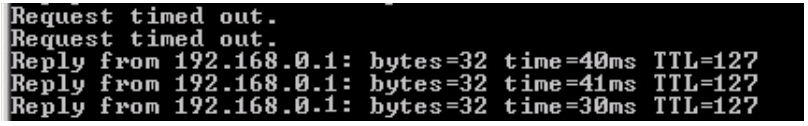

Figure 2-11

At this point the connection is established.

Note: If you cannot connect, see "Troubleshooting Tips" on page 4-1. For problems accessing network resources, the Windows client and file and print sharing software might not be installed or configured correctly on your computers. See the link to "Internet Networking and TCP/IP Addressing:" in Appendix B.

Starting a Computer-to-Computer (Ad Hoc) Network Connection

1. On the Settings tab of the Smart Wizard, select or type the network name (SSID).
2. Select the **Computer-to-Computer (Ad Hoc)** network type.

Note: for Windows Vista computers, you must have administrator rights. Otherwise, this option is not available for selection.

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3. Click **Initiate Ad Hoc**. The Ad Hoc Setting screen displays:

Figure 2-12

4. In the **Start Ad Hoc** drop-down list, select either 2.4GHz (802.11 b/g), or 5 GHz (802.11a) for your Ad Hoc computer-to-computer network.
5. In the **Channel** drop-down list, **Automatic** should work. If you notice interference problems with another nearby wireless device, select a channel that is not being used by other nearby wireless networks. Use the Networks tab to view the channels in use in your area.
6. Click **OK**.

	Note: The channel number differs depending on the country. The connection speed automatically defaults to the highest speed.

About Wireless Security

Many networks use wireless security to encrypt wireless data communications. To connect to a network with wireless security, you must set up the adapter with exactly the same wireless security settings. If you use the Smart Wizard to set up security, you can take advantage of Push 'N' Connect (WPS) to set up WPA-PSK [TKIP] security (see “Using Push 'N' Connect (WPS) to Connect to a Wireless Network” on page 2-3). Otherwise, you can manually set one of the following types of wireless security used for home networks:

- **WPA-PSK [TKIP] or WPA2-PSK [AES].** See “Setting Up WPA-PSK [TKIP] or WPA2-PSK [AES] Security” on page 2-15.
- **WEP**. See “Setting Up WEP Encryption Security” on page 2-16.

For more information about wireless security, see the link to “Wireless Communications:” in Appendix B. In addition to wireless security, you should configure appropriate LAN network security such as requiring a user name and password to access shared resources in your network.

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Wireless Network Name (SSID) and Security Settings

Print this form, fill in the configuration parameters, and put it in a safe place for future reference. For an existing wireless network, the person who set up the network can provide this information.

- **Network Name (SSID)**. The service set Identification (SSID) identifies the wireless local area network. **Any (First available network)** is the default WNDA3100v2 wireless network name (SSID). You may customize it using up to 32 alphanumeric characters. Write your customized wireless network name (SSID) on the line below.

	Note: The SSID in the wireless access point is the SSID you configure in the wireless-N USB adapter. For the access point and wireless nodes to communicate with each other, all must be configured with the same SSID.

  Wireless network name (SSID): _____

- **If WPA2-PSK or WPA-PSK authentication is used**:
  - **Passphrase**: _____ These characters are case-sensitive. Enter a word or group of printable characters. When you use WPA-PSK, the other devices in the network cannot connect unless they are set to WPA-PSK as well, and are configured with the correct passphrase.
- **If WEP authentication is used**:
  - **WEP encryption key size**. Identify one: **64-bit** or **128-bit**. The encryption key size must match the wireless network settings.
  - **Data encryption (WEP) keys**. There are two methods for creating WEP data encryption keys. Whichever method you use, record the key values in the spaces below.
    - **Passphrase method**: _____ These characters are case-sensitive. Enter a word or group of printable characters and click the **Generate Keys** button. Not all wireless devices support the passphrase method.
    - **Manual method**. These values *are not* case sensitive. For 64-bit WEP, enter 10 hex digits (any combination of 0–9 or a–f). For 128-bit WEP, enter 26 hex digits.

    Key 1: _____ Key 2: _____

    Key 3: _____ Key 4: _____

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Setting Up WPA-PSK [TKIP] or WPA2-PSK [AES] Security

To configure WPA-PSK security:

1. Run the WNDA3100v2 Smart Wizard.
   a. Make sure that the WNDA3100v2 software is installed and the wireless-N USB adapter is fully inserted in a USB port in your computer.
   b. Use the icon to open the Smart Wizard. The Settings tab displays.
2. Configure the Security settings.
   a. In the **Profile** field, select the profile, or type in a profile name.
   b. In the **Network Name (SSID)** field, and then select the network, or enter the SSID.

> **Note:** You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

   c. In the Security section, select **WPA-PSK [TKIP]** or **WPA2-PSK [AES]**, and enter the passphrase.

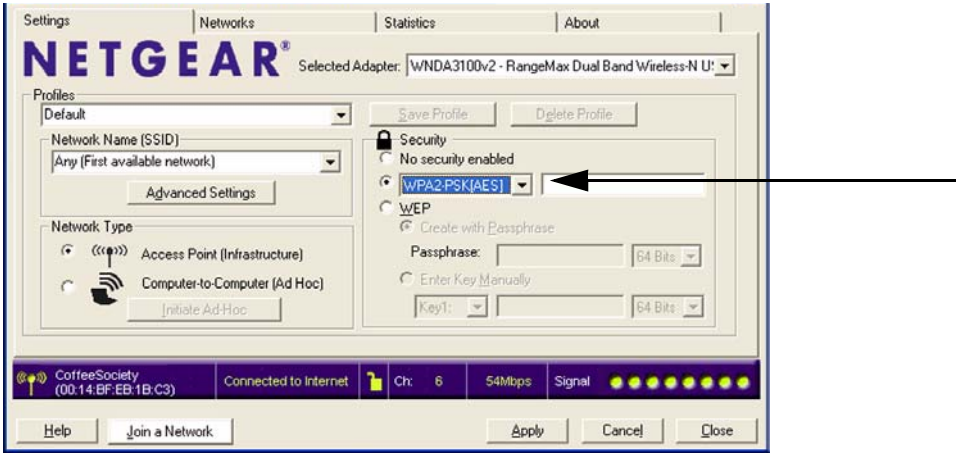

Figure 2-13

For more about WPA2-PSK, see the link to "Wireless Communications:" in Appendix B.

3. Save your settings in a profile.
   a. Click the **Save Profile** button. All the configuration settings are saved in this profile.

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b. Click **Apply**, and then click **Close** to exit the Smart Wizard.

Setting Up WEP Encryption Security

Follow the steps below to configure WEP encryption security:

1. Run the WNDA3100v2 Smart Wizard.

a. Make sure that the WNDA3100v2 software is installed and the wireless-N USB adapter is connected to the USB port in your computer.

b. Use the icon to open the Smart Wizard. The Settings tab displays.

2. Configure the Security settings.

a. In the **Profile** field, select the profile or type in a profile name.

b. In the **Network Name (SSID)** field, select the network, or enter the SSID.

> **Note:** You will not get a wireless network connection unless the network SSID matches exactly what is configured in the access point.

c. In the Security section, select **WEP**.

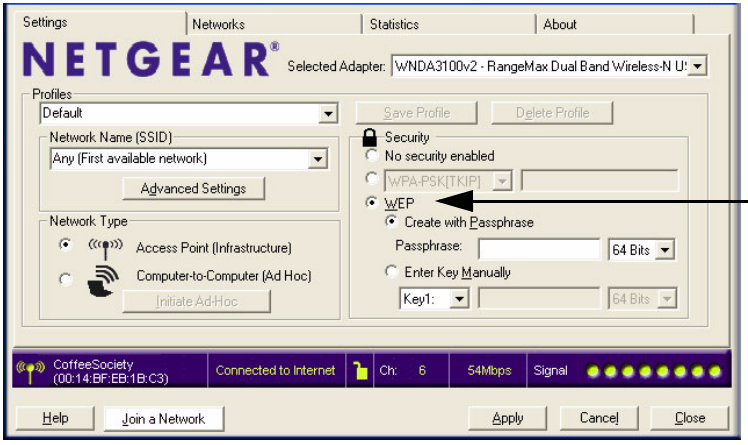

Figure 2-14

3. Select the WEP encryption strength you will use.

- 64-bit WEP data encryption
- 128-bit WEP data encryption

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	Note: Larger encryption keys require more processing and may slow the communications response times.

4. Select **Create with Passphrase**, and enter the passphrase. The configuration utility automatically generates the WEP keys.

	Note: The characters are case-sensitive. Be sure to use the same passphrase for all the wireless devices in the network.

If the passphrase method is not available in the other devices, you must manually enter the keys to match exactly what is in the access point and other 802.11b wireless devices.

5. Save your settings in a profile.
   a. Click the **Save Profile** button. All the configuration settings are saved in this profile.
   b. Click **Apply**.
   c. Click **Close** to exit the configuration utility.

Monitoring Statistics

The Statistics tab provides real time and historical trend information about the data traffic and performance of your wireless adapter.

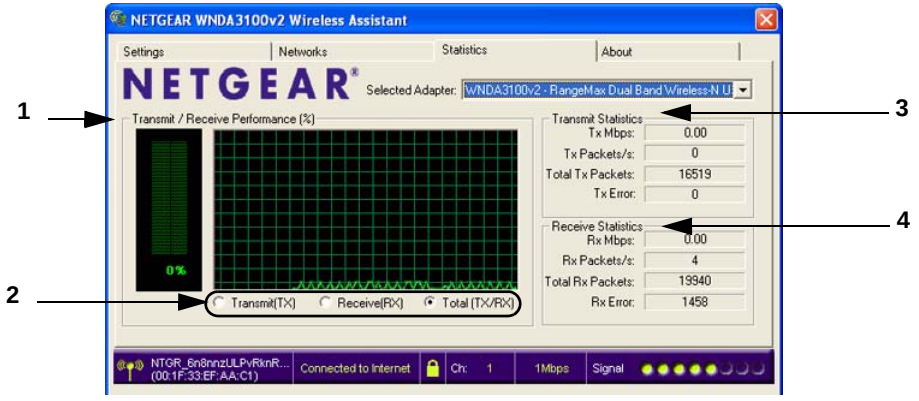

Figure 2-15

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Table 1. Statistics Descriptions

Label	Description
1. Transmit/Receive Performance (%)	A real-time graph identifies the total, receive, and transmit utilization as a percentage of the total possible.
2. Transmit, Receive, and Total (TxRx)	Radio buttons let you select whether to display the transmit performance, the receive performance, or both in the same graph.
3. Transmit Statistics	Identifies transmit megabits per second (Mbps), transmit packets per second (Tx Packets/s), total transmitted packets, and transmit errors.
4. Receive Statistics	Identifies receive megabits per second (Mbps), receive packets per second (Rx Packets/s), total received packets, and reception errors.

About Your Smart Wizard

The About tab displays the current version information.

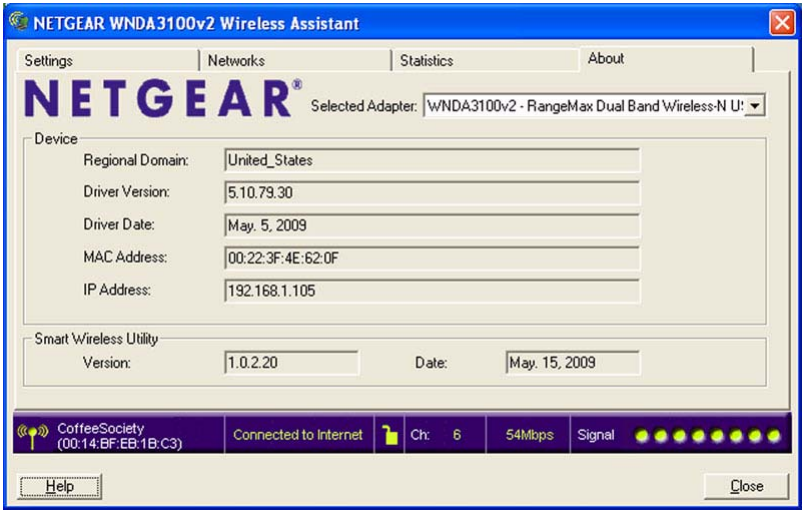

Figure 2-16

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About Tab Field		Description
Device	Regional Domain	This is the region setting for the wireless adapter. The approved channels for the region are automatically scanned. Governments regulate the channels used for wireless transmission. Operating the wireless adapter in a different region might violate local laws
	Driver version	The wireless adapter driver version.
	Driver Date	The wireless adapter driver release date.
	MAC Address	The MAC (Media Access Control) address of the adapter. This is a unique 48-bit hardware address assigned to every network interface card. Some wireless networks restrict access based on a list of known MAC addresses. If you are communicating with such a network, you must provide the address shown here to the network administrator before you are allowed to connect. Restricting access by MAC address adds an obstacle against unwanted access to your network. However, unless you use data encryption security, the data broadcast over the wireless link is fully exposed.
	IP Address	The IP address assigned to this adapter.
Smart Wireless Utility	Version	The version of the Smart Wizard.
	Date	The release date of the Smart Wizard.

Advanced Settings

The default advanced settings usually work fine. Except for the power saving setting, changing the settings incorrectly could cause your wireless connection to fail. Change them only if you have a specific reason to do so. To go to advanced settings, click **Advanced Settings** on the Settings tab.

Note: For Windows Vista computers, you must have administrator rights to access the Advance Settings screen.

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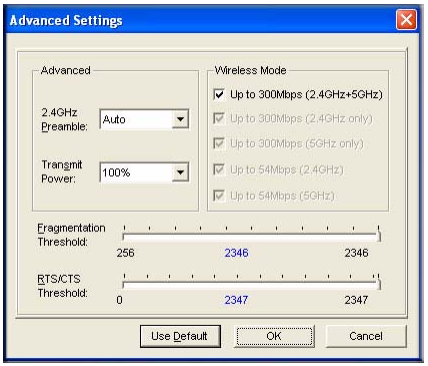

Figure 2-17

- **2.4GHz Preamble**. An Auto setting might give slightly better performance. A Long setting might provide a more reliable connection or slightly longer range.
- **Transmit Power**. Lowering the output power level lets you reduce the chance of interference with other nearby access points but reduces the range of your adapter.
- **Wireless Mode**. You can change the wireless mode, though the default setting works for either 2.4 GHz or 5GHz wireless networks. If you change this setting, make sure that your wireless router or access point is capable of operating in the same wireless mode.
- **Fragmentation Threshold**. This is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented. The Fragment Threshold value must be larger than the RTS Threshold value.
- **RTS/CTS Threshold**. The packet size that is used to determine whether it should use the CSMA/CD (Carrier Sense Multiple Access with Collision Detection) mechanism or the CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) mechanism for packet transmission. CSMA/CD is slightly more efficient.

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Chapter 3 Wireless Network Performance

This chapter explains how to use your wireless-N USB adapter to connect to your wireless local area network (WLAN) and how to maximize the performance of your wireless-N USB adapter within your network. Included are scenarios for setting up your network in a mixed use environment and the trade-off of using different types of technology—wireless, wired, or Powerline.

Optimizing Wireless Performance

The speed and operating distance or range of your wireless connection can vary significantly based on the location of the wireless router. You should choose a location for your router that will maximize the network speed.

The following list describes how to optimize wireless router performance.

- Identify critical wireless links.
  If your network has several wireless devices, decide which wireless devices need the highest data rate, and locate the router near them. Many wireless products have automatic data-rate fallback, which allows increased distances without losing connectivity. This also means that devices that are farther away mighty be slower. Therefore, the most critical links in your network are those where the traffic is high and the distances are great. Optimize those first.
- Choose placement carefully. For best results, place your router:
  - Near the center of the area in which your computers will operate.
  - In an elevated location such as a high shelf where the wirelessly connected computers have line-of-sight access (even if through walls).
- Avoid obstacles to wireless signals.
  - Keep wireless devices at least two feet from large metal fixtures such as file cabinets, refrigerators, pipes, metal ceilings, reinforced concrete, and metal partitions.
  - Keep the devices away from large amounts of water such as fish tanks and water coolers.
- Reduce interference.

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Avoid windows unless communicating between buildings.
Place wireless devices away from various electromagnetic noise sources, especially those in the 2400–2500 MHz frequency band. Common noise-creating sources are:

  - Computers and fax machines (no closer than 1 foot)
  - Copying machines, elevators, and cell phones (no closer than 6 feet)
  - Microwave ovens (no closer than 10 feet)

- Choose your settings.
  - Use a scanning utility to determine what other wireless networks are operating nearby, and choose an unused channel.
  - Turn off SSID Broadcast, and change the default SSID. Other nearby devices might automatically try to connect to your network several times a second, which can cause significant performance reduction.

Optimizing Your Network Bandwidth

The speed of network connections depends on the type of equipment that you use. Try to use high-speed technologies for network connections with the heaviest traffic to avoid lower-speed bottlenecks in the path. Figure 3-1 on page 3-3 shows a home network that includes many different connection speeds.

In this network, the two PCs with gigabit (1000 Mbps) Ethernet adapters have a gigabit connection through the router to the storage server. With a high-speed router this connection allows for extremely fast backups or quick access to large files on the server. The PC connected through a pair of Powerline HD adapters is limited to the 200 Mbps speed of the Powerline HD connection. Although any of the links in this example would be sufficient for high-traffic applications such as streaming HD video, the use of older devices such as 10 Mbps Ethernet or 802.11b wireless would create a significant bottleneck.

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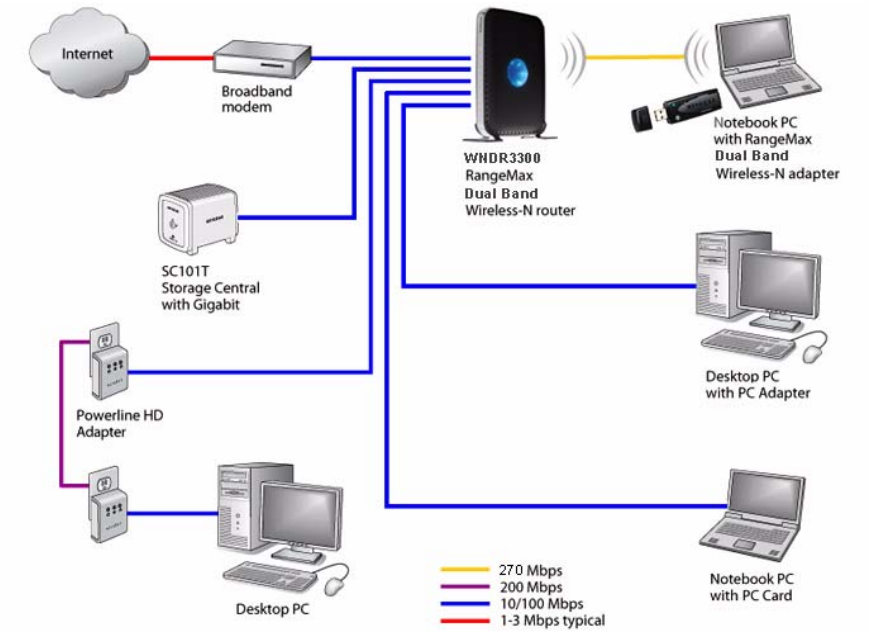

Figure 3-1

In planning your network, think about which tasks will have the heaviest traffic flow between them. Examples are:

- A media center in one room streaming high-definition video from a server in another room
- A storage device that is used for backing up your computers

SOHO Networking Technologies

Common connection types and their speed and security considerations are:

- **Broadband Internet**
  Your Internet connection speed is determined by your modem type, such as ADSL or cable modem, as well as the connection speed of the sites to which you connect, and general Internet traffic. ADSL and cable modem connections are asymmetrical, meaning they have a lower data rate *to* the Internet (upstream) than *from* the Internet (downstream). Keep in mind that when you connect to someone else who also has an asymmetrical connection, the data rate between your sites is limited by each side's upstream data rate. A typical residential ADSL or cable modem connection provides a downstream throughput of about 1 to 3 megabits per second (Mbps). Newer technologies such as ADSL2+ and Fiber to the Home (FTTH) l increase the connection speed to tens of Mbps.

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- **Wireless**
  A high-speed wireless router can provide a wireless data throughput of up to 300 Mbps using technology called multiple-input multiple-output (MIMO), in which multiple antennas transmit multiple streams of data. The use of multiple antennas also provides excellent range and coverage. With the introduction of the newer WPA and WPA2 encryption and authentication protocols, wireless security is extremely strong.

  To get the best performance, use newer adapters such as RangeMax adapters for your computers. A high-speed router might be compatible with older 802.11b and 802.11g adapters, but the use of these older wireless technologies in your network can result in lower throughput overall (typically less than 10 Mbps for 802.11b and less than 40 Mbps for 802.11g). In addition, many older wireless products do not support the latest security protocols, WPA and WPA2.

- **Powerline**
  For connecting rooms or floors that are blocked by obstructions or are distant vertically, consider networking over your building's AC wiring. NETGEAR's Powerline HD family of products delivers up to 200 Mbps to any outlet, while the older-generation XE family of products delivers 14 Mbps or 85 Mbps. Data transmissions are encrypted for security, and you can configure an individual network password to prevent neighbors from connecting.

  The Powerline HD family of products can coexist on the same network with older-generation XE family products or HomePlug 1.0 products, but they are not interoperable with these older products.

- **Wired Ethernet**
  As Gigabit Ethernet ports become common on newer computers, wired Ethernet remains a good choice for speed, economy, and security. Gigabit Ethernet can extend up to 100 meters with twisted-pair wiring of CAT-5e or better. A wired connection is not susceptible to interference, and eavesdropping would require a physical connection to your network.

	Note: Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, can lower actual data throughput rate.

Assessing Your Network Speed Requirements

Because your Internet connection is likely to operate at a much lower speed than your local network, faster local networking technologies might not improve your Internet experience. However, many emerging home applications require high data rates. For example:

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- Streaming HD video requires 10 to 30 Mbps per stream. Because latency and packet loss can disrupt your video, plan to provide at least twice the capacity you need.
- Streaming MP3 audio requires less than 1 Mbps per stream and does not strain most modern networks. Like video, however, streaming audio is also sensitive to latency and packet loss, so a congested network or a noisy link can cause problems.
- Backing up computers over the network has become popular due to the availability of inexpensive mass storage. Table 3-1 shows the time to transfer 1 gigabyte (1 GB) of data using various networking technologies.

Table 3-1. Theoretical Transfer Time for 1 Gigabyte

Network Connection	Theoretical Raw Transfer Time
Gigabit Wired Ethernet	8 seconds
RangeMax Dual Band Wireless-N	26 seconds
Powerline HD	40 seconds
100 Mbps Wired Ethernet	80 seconds
802.11g wireless	150 seconds
802.11b wireless	700 seconds
10 Mbps Wired Ethernet	800 seconds
Cable Modem (3 Mbps)	2700 seconds
Analog Modem (56 kbps)	144,000 seconds (40 hours)

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Chapter 4 Troubleshooting

This chapter provides information about troubleshooting your wireless-N USB adapter. For information about connecting to wireless networks and the Internet, see “Basic Setup” in Chapter 1.

Troubleshooting Tips

Use the following information to solve common problems you may encounter. Also, refer to the knowledge base on the NETGEAR website at *http://www.netgear.com/support*.

Table 4-1. Troubleshooting Tips

Problem	Action
The LED is not lit.	The wireless-N USB adapter is not connected to the USB port correctly or the WNDA3100v2 software is not loaded. • Remove and reinsert the WNDA3100v2. • Check the Windows device manager to see if the wireless-N USB adapter is recognized and enabled. Reload the WNDA3100v2 software, if necessary. • Try to install the wireless-N USB adapter in a different USB slot on your system if one is available.
The LED blinks, but the wireless-N USB adapter is not connected to a router or access point.	The wireless-N USB adapter is trying to connect, but is unsuccessful. • The router might not be powered on. • The router and the wireless-N USB adapter are not configured with the same wireless parameters. Check the SSID and wireless security settings.
Push ‘N Connect WPS time out error during installation.	This can occur if there are WPS routers in the area but your router does not support WPS. Make sure that you selected the correct wireless network. To select a network to join, see “Joining a Network” on page 2-2. For a WPS-capable router, see “Using Push 'N' Connect (WPS) to Connect to a Wireless Network” on page 2-3.

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Table 4-1. Troubleshooting Tips (continued)

Problem	Action
I cannot connect to a router or access point. The router is available, and there is good signal strength.	• If the router is WPA-PSK protected, you need the correct WPA-PSK passphrase. • The wireless-N USB adapter might still be connected to the previous wireless network. Use the Networks tab to view networks in your area and to select the correct wireless network. See “Connecting to a Wireless Network” on page 1-6. • If the router is WEP protected (either 64- or 128- bit encryption), you are prompted to enter the WEP encryption security information.
The connection status in the Status Bar shows that I am connected to a router or access point, but not to the Internet.	Check the router’s Internet connection.
Throughput is only 54 Mbps or only 14 Mbps.	The wireless-N USB adapter can operate at faster speeds. • At 54 Mbps you are probably connecting to a standard 802.11g network. See Chapter 3, “Wireless Network Performance”. • If you do not have a USB 2.0 port on your PC, the throughput is limited to the 14 Mbps of the USB 1.1 standard.
The Smart Wizard keeps asking me to save settings.	If you change the settings, the Smart Wizard offers you the chance to save the changes. To avoid this prompt, simply click **Apply** before you close the Smart Wizard.
Two WNDA3100v2 icons are in the system tray.	You have an older software version installed on your system and it needs to be removed. See “Removing the WNDA3100v2 Software” in Chapter 1 or “Upgrading the WNDA3100v2 Software” in Chapter 1.
I can connect to the access point, but not to the other computers on the network or to the Internet.	This could be a physical layer problem or a network configuration problem. 1. Check to make sure that the access point is physically connected to the Ethernet network. 2. Make sure that the IP addresses and the Windows networking parameters are all configured correctly. See the link to “Internet Networking and TCP/IP Addressing:” in Chapter B. 3. Restart the cable or DSL modem, router or access point, and computer.

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Table 4-1. Troubleshooting Tips (continued)

Problem	Action
How can I view the IP address for the wireless-N USB adapter?	To view the wireless-N USB adapter IP address, click the WNDA3100v2 icon to open the Smart Wizard. Then check the IP address in the About page.
No IP address is assigned to the RangeMax Dual Band Wireless-N USB Adapter.	This can occur if you upgraded your WNDA3100v2 software and did not reboot your system. • Either restart your computer, or connect to a different access point. • It does not usually help to shut down the Smart Wizard or disable or enable the wireless-N USB adapter.

Ad Hoc Mode Is Not Working Correctly

You must click the Initiate Ad Hoc button before you click **Apply**. Here is how you start an Ad Hoc network:

1. Fill in the **Network Name (SSID)** field.
2. Select the **Computer-to-Computer (Ad Hoc)** network type.
3. Click **Initiate Ad Hoc**.
4. Accept the default settings, or make your changes and click **OK**.
5. Click **Apply**.

Note: Be sure that all computers in your Ad Hoc network are configured with static IP addresses in the same subnet.

Windows XP Occasional Connection Problems

Windows XP users who apply Windows XP Hotfix (SP2) Q815485 from the Windows XP Update Service might not be able to connect to the Internet, might have dropped wireless connections, or both when using the RangeMax Dual Band Wireless-N USB Adapter. You can delete this Hotfix from the Add or Remove Programs utility in the Control Panel.

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To delete Windows XP Hotfix (SP2) Q815485:

1. Select Start > Control Panel > Add/Remove Programs.
2. Select Windows XP Hotfix (SP2) Q815485, and then click **Remove**.
   - You might receive an error message that states that some program on the computer may not work correctly if the update is removed.
   - You can ignore this error message, and then click **Yes** to remove the update.
3. Restart your computer, and rerun the Smart Display Setup Wizard.

This should solve your connection issue. You can restore this hotfix by following this link: *http://microsoft.com/downloads/details.aspx?FamilyId=009D8425-CE2B-47A4-ABEC-274845DC9E91&displaylang=en*

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Appendix A Technical Specifications and Factory Default Settings

Technical Specifications

The following table provides technical specifications for the wireless-N USB adapter.

Antenna	2 integrated internal wireless antennas
Standards	802.11a, 802.11n draft 2.0, 802.11g, or 802.11b
Radio Data Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, 108, 140, 246, and 300 Mbps (Auto Rate Sensing)
Frequency	2.4 GHz to 2.5 GHz (CCK and OFDM Modulation); 5 GHz
Power	5V Bus powered
Emissions	FCC, CE
Bus interface	USB 2.0
Provided drivers	Microsoft Vista, Windows XP
Operating Environment	Operating temperature: 0 to 40° C
Encryption	40-bit (also called 64-bit) and 128-bit WEP data encryption, and WPA-PSK
Warranty	Limited 1-year warranty

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Factory Default Settings

The following table lists the default settings of your wireless-N USB adapter.

Feature		Description
Smart Wizard		Enabled
Wireless		
	Wireless Communication	Enabled
	Wireless Network Name (SSID)	Any (will connect to first wireless network that responds)
	Security	Disabled
	Network Type	Infrastructure
	Transmission Speed	Auto[a]
	Country/Region	United States (varies by region)
	Operating Mode	Up to 300 Mbps (2.4GHZ + 5GHz)
	Data Rate	Up to 300 Mbps

a. Maximum wireless signal rate (IEEE Standard 802.11). Actual throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.

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Appendix B Related Documents

This appendix provides links to reference documents you can use to gain a more complete understanding of the technologies used in your NETGEAR product.

Document	Link
Windows XP and Vista Wireless Configuration Utilities Application Note	*http://documentation.netgear.com/reference/enu/winzerocfg/index.htm*
Internet Networking and TCP/IP Addressing:	*http://documentation.netgear.com/reference/enu/tcpip/index.htm*
Wireless Communications:	*http://documentation.netgear.com/reference/enu/wireless/index.htm*
Preparing a Computer for Network Access:	*http://documentation.netgear.com/reference/enu/wsdhcp/index.htm*
Virtual Private Networking (VPN):	*http://documentation.netgear.com/reference/enu/vpn/index.htm*
Glossary:	*http://documentation.netgear.com/reference/enu/glossary/index.htm*

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